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Product Description

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Cell Lines

ATCC® Number: CRL-1593.2™

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Price: \$185.00

Designations: U-937

Depositors: H Koren

Biosafety Level: 1

Shipped: frozen

Medium & Serum: [See Propagation](#)

Growth Properties: suspension

Morphology: monocyte

Organism: *Homo sapiens* (human)



Source: **Disease:** histiocytic lymphoma

Cellular Products: lysozyme; beta-2-microglobulin (beta 2 microglobulin); tumor necrosis factor (TNF), also known as tumor necrosis factor alpha (TNF-alpha, TNF alpha), after stimulation with phorbol myristic acid (PMA)

Permits/Forms: In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please [click here](#) for information regarding the specific requirements for shipment to your location.

[Related Cell Culture Products](#)

Restrictions:	The original U-937 cell line was established by Dr. K. Nilsson's laboratory in 1974 and he has requested the following: (1) In all papers reporting any use of this cell line or any derivatives thereof a direct reference should be made to Sundstrom and Nilsson (Int. J. Cancer 17: 565-577, 1976). (2) Any proposed commercial use of the cells should be negotiated with Pharmacia Diagnostics AB, S-751 82 Uppsala, Sweden; (3) No distribution of any of the cells or sublines derived therefrom should be made to third parties; (4) The cells should be used for non-clinical, non-commercial research only.
Isolation:	Isolation date: 1974
Receptors:	complement (C3)
DNA Profile (STR):	Amelogenin: X CSF1PO: 12

	D13S317: 10,12 D16S539: 12 D5S818: 12 D7S820: 9,11 THO1: 9.3 TPOX: 8,11 vWA: 15
Age:	37 years
Gender:	male
Ethnicity:	Caucasian
Comments:	<p>The U-937 cell line was derived by Sundstrom and Nilsson in 1974 from malignant cells obtained from the pleural effusion of a patient with histiocytic lymphoma. Studies since 1979 have shown that U-937 cells can be induced to terminal monocytic differentiation by supernatants from human mixed lymphocyte cultures, phorbol esters, vitamin D3, gamma interferon, tumor necrosis factor (TNF) and, retinoic acid.</p> <p>The cells are negative for immunoglobulin production and Epstein-Barr virus expression.</p> <p>The cells express the Fas antigen, and are sensitive to TNF and anti-Fas antibodies. In 1994, PCR and cytogenetic analyses showed that a number of stocks of U-937 were contaminated with the human myeloid leukemia cell line, K-562.</p> <p>In the earliest stocks available, the level of contamination was 0.6%. [40484]</p> <p>Distribution was discontinued in March 1994, except if required for patent purposes. Anyone who wishes to receive a sample of this original material should contact the Head of the ATCC Patent Depository.</p> <p>A stock of CRL-1593 found to be free of K-562 was propagated continuously for 8 weeks and tested weekly by PCR.</p> <p>Distribution and seed stocks give DNA profiles characteristic of U-937 only. Such preparations are now offered as authentic U-937 (ATCC <u>CRL-1593.2</u>) and are believed to be free of second subpopulations.</p>
Propagation:	<p>ATCC complete growth medium: RPMI 1640 medium with 2 mM L-glutamine adjusted to contain 1.5 g/L sodium bicarbonate, 4.5 g/L glucose, 10 mM HEPES, and 1.0 mM sodium pyruvate, 90%; fetal bovine serum, 10%</p> <p>Temperature: 37.0C</p> <p>Atmosphere: air, 95%; carbon dioxide (CO2), 5%</p>
Subculturing:	<p>Protocol: Cultures can be maintained by the addition of fresh medium or replacement of medium. Alternatively, cultures can be established by centrifugation with subsequent resuspension at 1 to 2 X 10⁽⁵⁾ viable cells/ml.</p> <p>Interval: Maintain cell density between 1 X 10⁽⁵⁾ and 2 X 10⁽⁶⁾ viable cells/ml.</p> <p>Medium renewal: Add fresh medium every 3 to 4 days (depending on cell density)</p>
Preservation:	<p>Freeze medium: Complete growth medium supplemented with 5% (v/v) DMSO</p> <p>Storage temperature: liquid nitrogen vapor phase</p>
Related Products:	<p>Recommended medium (without the additional supplements or serum described under ATCC Medium): ATCC <u>30-2001</u></p> <p>recommended serum: ATCC <u>30-2020</u></p>
References:	<p><u>1080</u>: Ralph P , et al. Lysozyme synthesis by established human and murine histiocytic lymphoma cell lines. J. Exp. Med. 143: 1528-1533, 1976. PubMed: <u>1083890</u></p> <p><u>21866</u>: , editors. Gene expression during normal and malignant differentiation. 143: London: Academic Press; 1985, pp. 57-72.</p> <p><u>21876</u>: , editors. International symposium on new trends in human immunology and cancer immunotherapy. Paris: Doin Editeurs; 1980, pp. 271-292.</p> <p><u>22906</u>: Koren HS , et al. In vitro activation of a human macrophage-like cell line. Nature 279: 328-331, 1979. PubMed: <u>450085</u></p> <p><u>22912</u>: Gidlund M , et al. Natural killer cells kill tumour cells at a given stage of differentiation. Nature 292: 848-850, 1981. PubMed: <u>7266653</u></p> <p><u>23049</u>: Olsson I , et al. Induction of differentiation of the human histiocytic lymphoma cell line U-937 by 1 alpha,25-dihydroxycholecalciferol. Cancer Res. 43: 5862-5867, 1983. PubMed: <u>6315218</u></p> <p><u>23103</u>: Morimoto H , et al. Overcoming tumor necrosis factor and drug resistance of human tumor cell lines by combination treatment with anti-Fas antibody and drugs or toxins. Cancer Res. 53: 2591-2596, 1993. PubMed: <u>7684321</u></p>

29094: Giovannangeli C , et al. Accessibility of nuclear DNA to triplex-forming oligonucleotides: The integrated HIV-1 provirus as a target. Proc. Natl. Acad. Sci. USA 94: 79-84, 1997. PubMed: 8990164
29139: Brigino E , et al. Interleukin 10 is induced by recombinant HIV-1 Nef protein involving the calcium/calmodulin-dependent phosphodiesterase signal transduction pathway. Proc. Natl. Acad. Sci. USA 94: 3178-3182, 1997. PubMed: 9096366
40484: Reid YA , et al. Cell Line Cross-contamination of U-937. J. Leukocyte Biol. 57: 804, 1995. PubMed: 7759961
58042: Sundstrom C , Nilsson K . Establishment and characterization of a human histiocytic lymphoma cell line (U-937). Int. J. Cancer 17: 565-577, 1976. PubMed: 178611

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Cell Lines	
ATCC® Number:	CCL-243™ Order this item
Price:	\$185.00
Designations:	K-562
Depositors:	HT Holden
Biosafety Level:	1
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	suspension
Organism:	<i>Homo sapiens</i> (human)
Morphology:	lymphoblast
Source:	Organ: bone marrow Disease: chronic myelogenous leukemia (CML)
Permits/Forms:	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.
Related Cell Culture Products	
Tumorigenic:	Yes, in nude mice (Tumors developed within 21 days at 100% frequency (5/5) in nude mice inoculated subcutaneously with 10(7) cells)
Reverse Transcript:	negative
Antigen Expression:	CD7 (25%)
DNA Profile (STR):	Amelogenin: X CSF1PO: 9,10 D13S317: 8 D16S539: 11,12 D5S818: 11,12 D7S820: 9,11 TH01: 9.3 TPOX: 8,9 vWA: 16
Cytogenetic Analysis:	The stemline chromosome number is triploid with the 2S component occurring at 4.2%. Fifteen markers (M1 and M(15)) occurred in nearly all S metaphases. Spontaneous non-specific dicentrics occurred, but rarely. Unstable markers were

	also rarely seen. The X was disomic, and N9 was nullisomic.
Isoenzymes:	AK-1, 1; ES-D, 1; G6PD, B; GLO-I, 2; Me-2, 0; PGM1, 0; PGM3, 1
Age:	53 years
Gender:	female
Comments:	<p>The continuous cell line K-562 was established by Lozzio and Lozzio from the pleural effusion of a 53-year-old female with chronic myelogenous leukemia in terminal blast crises. [22609]</p> <p>The cell population has been characterized as highly undifferentiated and of the granulocytic series. [26059]</p> <p>Studies conducted by Anderson, et al., on the surface membrane properties led to the conclusion that the K-562 was a human erythroleukemia line. [26060]</p> <p>The K-562 cell line has attained widespread use as a highly sensitive in vitro target for the natural killer assay. [1101] [48829] [48830]</p> <p>See Pross, et al. for a detailed analysis of the in vitro assay of NK cells including the mathematics of quantitation of NK cell activity. [48833]</p> <p>K-562 blasts are multipotential, hematopoietic malignant cells that spontaneously differentiate into recognizable progenitors of the erythrocytic, granulocytic and monocytic series. [26061]</p> <p>The effect of inducers on sublines derived from the original K-562 cell line have been reviewed by Koeffler and Golde. [867]</p> <p>Cultures from the ATCC stock have been shown to exhibit this sensitivity for assessing human natural killer activity.</p> <p>Karyological studies on various K-562 sublines have been classified into three groups (A,B,C) by Dimery, et al. [26063]</p> <p>The strain obtained by the ATCC most closely resembles the B population.</p> <p>Occurrence of the Philadelphia chromosome, however, was of much lower frequency; none detected in 15 metaphases examined.</p> <p>The line is EBNA negative.</p>
Propagation:	<p>ATCC complete growth medium: Iscove's modified Dulbecco's medium with 4 mM L-glutamine adjusted to contain 1.5 g/L sodium bicarbonate, 90%; fetal bovine serum, 10%</p> <p>Temperature: 37.0C</p> <p>Atmosphere: air, 95%; carbon dioxide (CO₂), 5%</p>
Subculturing:	<p>Protocol: Cultures can be maintained by the addition or replacement of fresh medium. Start new cultures at 1 X 10⁵ viable cells/ml. Subculture at 1 X 10⁶ cells/ml.</p> <p>Medium renewal: Every 2 to 3 days</p>
Preservation:	<p>Freeze medium: Complete growth medium 95%; DMSO, 5%</p> <p>Storage temperature: liquid nitrogen vapor temperature</p>
Related Products:	<p>Recommended medium (without the additional supplements or serum described under ATCC Medium): ATCC 30-2005</p> <p>recommended serum: ATCC 30-2020</p> <p>purified DNA: ATCC CCL-243D</p> <p>purified RNA: ATCC CCL-243R</p>
References:	<p>867: Koeffler HP , Golde DW . Human myeloid leukemia cell lines: a review. Blood 56: 344-350, 1980. PubMed: 6996765</p> <p>1101: Ortaldo JR , et al. Specificity of natural cytotoxic reactivity of normal human lymphocytes against a myeloid leukemia cell line. J. Natl. Cancer Inst. 59: 77-82, 1977. PubMed: 69036</p> <p>22609: Lozzio CB , Lozzio BB . Human chronic myelogenous leukemia cell-line with positive Philadelphia chromosome. Blood 45: 321-334, 1975. PubMed: 163658</p> <p>26059: Lozzio BB , Lozzio CB . Properties and usefulness of the original K-562 human myelogenous leukemia cell line. Leuk. Res. 3: 363-370, 1979. PubMed: 95026</p> <p>26060: Andersson LC , et al. K562--a human erythroleukemic cell line. Int. J. Cancer 23: 143-147, 1979. PubMed: 367973</p> <p>26061: Lozzio BB , et al. A multipotential leukemia cell line (K-562) of human origin. Proc. Soc. Exp. Biol. Med. 166: 546-550, 1981. PubMed: 7194480</p> <p>26063: Dimery IW , et al. Variation amongst K562 cell cultures. Exp. Hematol. 11: 601-610, 1983. PubMed: 6576909</p> <p>32357: Chan YJ , et al. Two distinct upstream regulatory domains containing</p>

multicopy cellular transcription factor binding sites provide basal repression and inducible enhancer characteristics to the immediate-early IES (US3) promoter from human cytomegalovirus. J. Virol. 70: 5312-5328, 1996. PubMed: [8764042](#)

[32396](#): Kolanus W , et al. alphaLbeta2 integrin/LFA-1 binding to ICAM-1 induced by cytohesin-1 a cytoplasmic regulatory molecule. Cell 86: 233-242, 1996. PubMed: [8706128](#)

[32446](#): Gan W , Rhoads RE . Internal initiation of translation directed by the 5'-untranslated region of the mRNA for eIF4G, a factor involved in the picornavirus-induced switch from cap-dependent to internal initiation. J. Biol. Chem. 271: 623-626, 1996. PubMed: [8557663](#)

[32561](#): Tiffany HL , et al. Enhanced expression of the eosinophil-derived neurotoxin ribonuclease (RNS2) gene requires interaction between the promoter and intron. J. Biol. Chem. 271: 12387-12393, 1996. PubMed: [8647842](#)

[32704](#): Chan YJ , et al. Synergistic interactions between overlapping binding sites for the serum response factor and ELK-1 proteins mediate both basal enhancement and phorbol ester responsiveness of primate cytomegalovirus. J. Virol. 70: 8590-8605, 1996. PubMed: [8970984](#)

[33044](#): Nauseef WM , et al. Effect of the R569W missense mutation on the biosynthesis of myeloperoxidase. J. Biol. Chem. 271: 9546-9549, 1996. PubMed: [8621627](#)

[33174](#): Grune T , et al. Degradation of oxidized proteins in K562 human hematopoietic cells by proteasome. J. Biol. Chem. 271: 15504-15509, 1996. PubMed: [8663134](#)

[48829](#): Jondal M , Pross H . Surface markers on human b and t lymphocytes. VI. Cytotoxicity against cell lines as a functional marker for lymphocyte subpopulations. Int. J. Cancer 15: 596-605, 1975. PubMed: [806545](#)

[48830](#): West WH , et al. Natural cytotoxic reactivity of human lymphocytes against a myeloid cell line: characterization of effector cells. J. Immunol. 118: 355-361, 1977. PubMed: [299761](#)

[48833](#): Pross HF , et al. Spontaneous human lymphocyte-mediated cytotoxicity against tumor target cells. IX. The quantitation of natural killer cell activity. J. Clin. Immunol. 1: 51-63, 1981. PubMed: [7334070](#)

[61237](#): Chen TR . Modal karyotype of human leukemia cell line, K562 (ATCC CCL 243). Cancer Genet. Cytogenet. 17: 55-60, 1985. PubMed: [3857109](#)

[61327](#): Wu SQ , et al. Extensive amplification of bcr/abl fusion genes clustered on three marker chromosomes in human leukemic cell line K-56. Leukemia 9: 858-862, 1995. PubMed: [7769849](#)

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